

**Matsushita Kotobuki
Electronics Industries Ltd.**

Storage Products Business Unit
Address: 2131-1 Minamigata, Kawauchi-cho, Onsen, Ehime 791 – 0395 Japan

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TEST REPORT

REPORT NUMBER : MKM04F-001

APPLICANT : Matsushita Kotobuki
Electronics Industries, Ltd.

MODEL NUMBER : LKM-S121-S

FCC ID : IUO9TB099DSS

Regulation : FCC Part15B Class B

Conducted Emission Test
Radiated Emission Test

Matsushita Kotobuki Electronics Ind., Ltd.
Storage Products Business Unit

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SECTION 1. TEST CERTIFICATION**APPLICANT INFORMATION**

Company : Matsushita Kotobuki Electronics Industries, Ltd.
Address : 2131-1 Minamigata, Kawauchi-cho, Onsen-gun,
Ehime-ken, 791-0395 Japan

GRANTEE INFORMATION

Company : Matsushita Kotobuki Electronics Industries, Ltd.
Division / Section : Storage Products Business Unit Legal Affairs Team.
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Contact person : Shinji Yamauchi

DESCRIPTION OF TEST ITEM

Kind of equipment : DDS BACKUP LIBRARY
Trademark : Matsushita Kotobuki
FCC ID : IUO9TB099DSS
Model number : LKM-S121-S
Serial number : AA411300M00001

TEST PERFORMED	
FCC Registration No.	: 90793
Test started	: February 16, 2004
Test completed	: February 17, 2004
Purpose of test	: FCC Docket 87-389
Regulation	: FCC Part 15B Class B Unintentional Radiators
Test setup	: ANSI C63.4 -1992

Report file number : MKM04F-001

Report issue date : February 20, 2004

Test engineer : Shinji Yamauchi *S. Yamauchi*

Report approved by : Hisayuki Honda *H. Honda*
[Manager]

This equipment complies with above standard or regulation under the test condition or test configuration shown on this test report.

SECTION 2. EQUIPMENT UNDER TEST

The equipment under test (EUT) consists of the following equipment.

Indication in the following left side column corresponds to section 5.

Symbol	Item	Model No.	Serial No.	FCC ID	Manufacturer
A)	DDS BACKUP LIBRARY	LKM-S121-S	AA411300M00001	IUO9TB099DSS	Matsushita Kotobuki Electronics Ind., Ltd.

Power ratings of EUT : AC 120V-240V,50Hz/60Hz, 0.5A-0.28A

2.1 Port(s) / Connector(s) :

SCSI Half pitch Connector (68pin)

SCSI Half pitch Connector (68pin)

2.2 Oscillator(s) / Crystal(s) :

Oscillator	Operating Frequency	Board name	Remarks
30 MHz	15 MHz	Main PCB	CPU
30 MHz	30 MHz	Main PCB	Gate Array
30 MHz	15 MHz	Buffer PCB	CPU
30 MHz	30 MHz	Buffer PCB	Gate Array
27 MHz	126 MHz (*)	DAT72 MainPCB	Channel_clock
40 MHz	40 MHz	DAT72 MainPCB	Logic_clock
40 MHz	40 MHz	DAT72 MainPCB	SCSI_clock

(*) Highest frequency

SECTION 3. SUPPORT EQUIPMENT USED

The EUT has been supported by the following equipment during these tests. Indication in the following left side column corresponds to section 5.

Symbol	Item	Model No.	Serial No.	FCC ID	Manufacturer
B)	Interface Card	AHA-2940UW	BF0C8240193	FGT2940UW	ADAPTEC
C)	Host Computer	OptiPlex GXa DCS	SP4BX	Declaration of Conformity	DELL
D)	Color Display	XC-1429C	009133290	BGB9J5XC-1429C	MITSUBISHI
E)	Printer	3630A	3040A00351	BSD8533630A	HEWLETT PACKARD
F)	Keyboard	G9900	J434518	GYUR61SK	GATEWAY
G)	Mouse	Mouse Port CompatibleMouse2.1A	01171231	C3KKMP3	Microsoft
H)	DAT Data Storage Drive	LKM-DE4H-7	250412	None	Matsushita Kotobuki

SECTION 4. CABLE(S) USED

The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

Number	Name	Length	Shield	From	To
1)	SCSI cable	2.0 m	Yes	Interface Card Metal connector	DDS BACKUP LIBRARY
2)	SCSI cable	2.0 m	Yes	DDS BACKUP LIBRARY Metal connector	DAT Data Storage Drive
3)	Parallel I/F cable	1.5 m	Yes	Host Computer Metal connector	Printer
4)	Keyboard I/F cable	1.9 m	Yes	Host Computer Metal connector	Keyboard
5)	Mouse cable	1.9 m	None	Host Computer Metal connector	Mouse
6)	Video Signal cable	1.4 m	Yes	Host Computer Metal connector	Color Display
7)	Power cord for EUT	1.7 m	None	EUT	Power Source
8)	Power cord for DAT Data Storage Drive	1.7 m	None	DAT Data Storage Drive	Power Source
9)	Power cord for Host Computer	1.3 m	None	Host Computer	Power Source

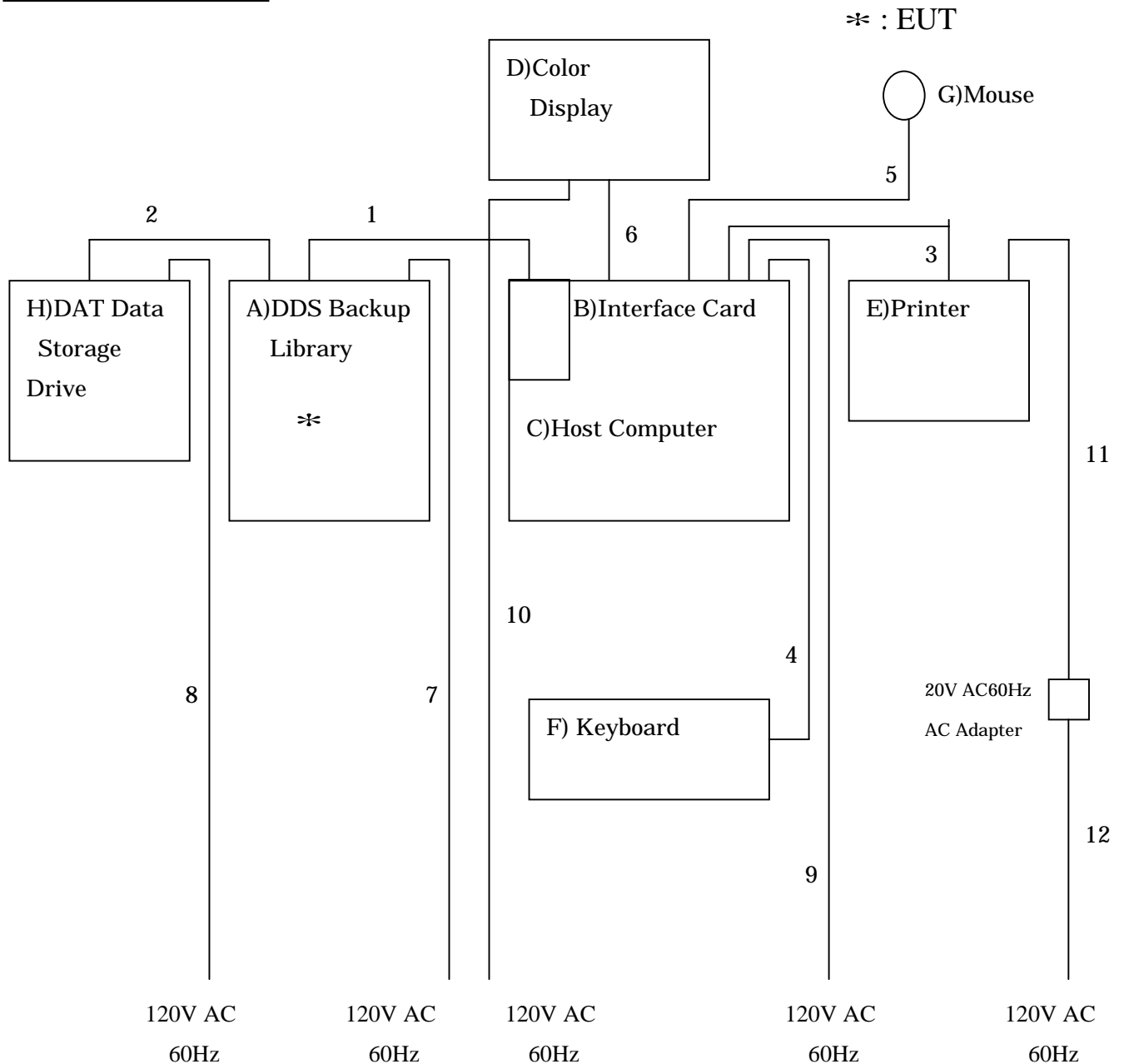
The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

Number	Name	Length	Shield	From	To
10)	Power cord for Color Display	1.5 m	None	Color Display	Power Source
11)	Power cord for Printer	2.0 m	None	Printer	AC Adapter
12)	Power cord for Printer	2.0 m	None	AC Adapter	Power Source

SECTION 5. CONSTRUCTION OF EQUIPMENT

The construction of EUT during testing is as follows.

System configuration



Symbol or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 2 to 4.

SECTION 6. OPERATING CONDITIONS

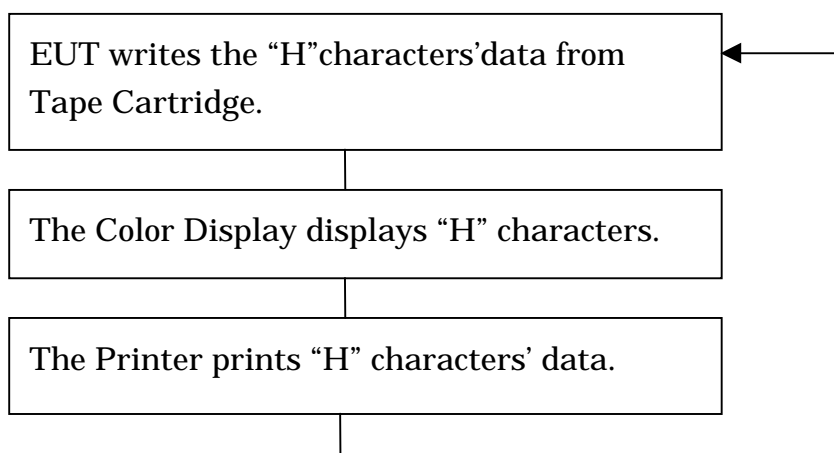
The EUT has been operated under the following conditions during the tests.

6.1 Operating condition

The tests have been carried out under Write mode.

6.2 Operation flow

Performed following operations continuously.



SECTION 7. TEST PROCEDURE(S)

Tests have been carried out with the test procedure(s) drawn up by our laboratory which is in accordance with the following test procedure(s).

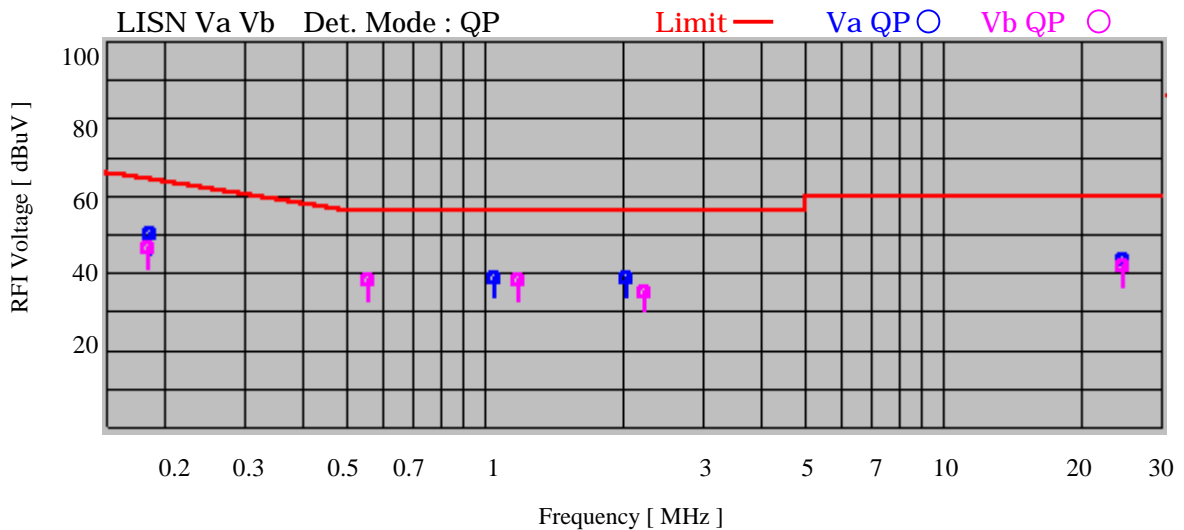
Test item	Test procedure used	Scanned Frequency Range
Conducted Emission	ANSI C63.4-1992	0.15 - 30 MHz
Radiated Emission	ANSI C63.4-1992	30 - 2000 MHz

SECTION 8. EVALUATION OF TEST RESULTS

8.1 Conducted Emission Test

Product Name	: DDS BACKUP LIBRARY
Model No.	: LKM-S121-S
Serial No.	: AA411300M00001
Power Supply	: 120V / 60Hz
Test Mode	: Write mode
Temp / Humi / Pres	: 21°C / 39% / 999hPa
Operator	: S. Yamauchi

No	Freq. [MHz]	Reading Level		Factor [dB]	Emission Level		Limit [dBuV]	Margin [dB]
		Va [dBuV]	Vb		Va [dBuV]	Vb		
1	0.187	49.9	----	0.1	50.0	----	64.2	14.2
2	0.186	----	46.3	0.1	----	46.4	64.2	17.8
3	0.562	----	37.7	0.1	----	37.8	56.0	18.2
4	1.060	38.6	----	0.1	38.7	----	56.0	17.3
5	1.186	----	37.7	0.1	----	37.8	56.0	18.2
6	2.058	38.4	----	0.2	38.6	----	56.0	17.4
7	2.246	----	34.8	0.2	----	35.0	56.0	21.0
8	24.758	----	40.5	1.0	----	41.5	60.0	18.5
9	24.744	42.4	----	1.0	43.4	----	60.0	16.6



8.2 Radiated Emission Test

Product Name	: DDS BACKUP LIBRARY
Model No.	: LKM-S121-S
Serial No.	: AA411300M00001
Power Supply	: 120V / 60Hz
Test Mode	: Write mode
Temp / Humi / Pres	: 19°C / 41% / 1009hPa
Operator	: S. Yamauchi

[Quasi Peak mode]

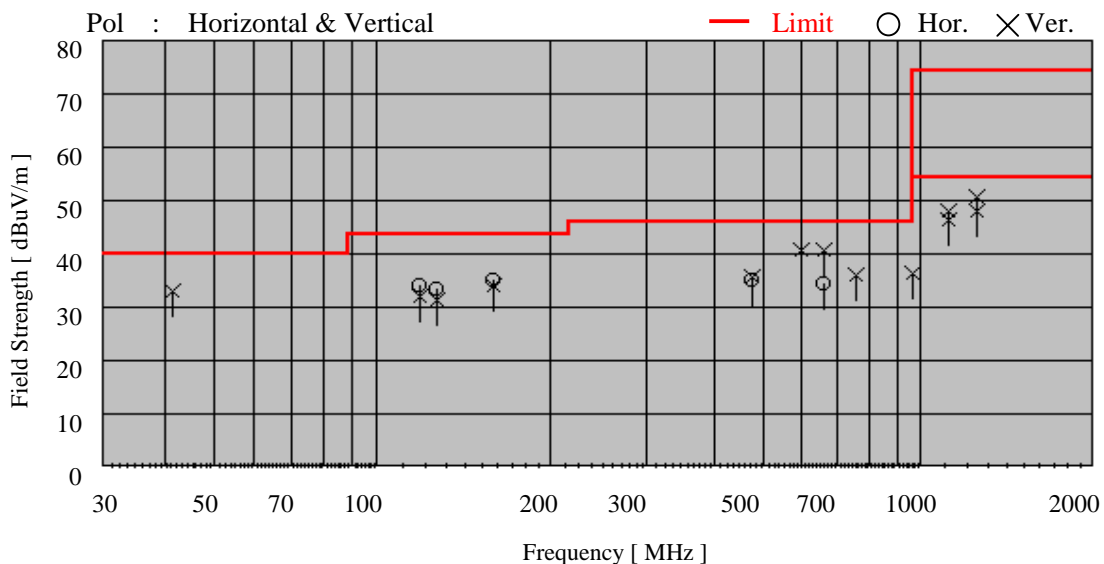
No	Freq. [MHz]	Reading Level		Factor [dB]	Emission Level		Limit [dBuV/m]	Margin [dB]
		Hor. [dBuV]	Ver.		Hor.	Ver.		
1	41.294	----	18.3	14.6	----	32.9	40.0	7.1
2	120.004	19.5	----	14.0	33.5	----	43.5	10.0
3	120.010	----	17.7	14.0	----	31.7	43.5	11.8
4	125.995	17.4	16.6	14.9	32.3	31.5	43.5	11.2
5	159.694	----	15.7	17.2	----	32.9	43.5	10.6
6	159.698	16.9	----	17.2	34.1	----	43.5	9.4
7	480.000	----	12.4	23.2	----	35.6	46.0	10.4
8	480.009	11.3	----	23.2	34.5	----	46.0	11.5
9	600.010	----	15.1	25.5	----	40.6	46.0	5.4
10	660.010	7.1	13.8	26.8	33.9	40.6	46.0	5.4
11	761.370	----	7.7	28.1	----	35.8	46.0	10.2
12	960.010	----	4.7	31.4	----	36.1	54.0	17.9

[Peak mode]

No	Freq. [MHz]	Reading Level		Factor [dB]	Emission Level		Limit [dBuV/m]	Margin [dB]
		Hor. [dBuV]	Ver.		Hor.	Ver.		
1	1160	----	58.7	-10.7	----	48.0	74.0	26.0
2	1277	----	60.2	-10.0	----	50.2	74.0	23.8

[Average mode]

No	Freq. [MHz]	Reading Level		Factor [dB]	Emission Level		Limit [dBuV/m]	Margin [dB]
		Hor. [dBuV]	Ver.		Hor.	Ver.		
1	1160	----	57.5	-10.7	----	46.8	54.0	7.2
2	1277	----	57.8	-10.0	----	47.8	54.0	6.2



8.3 Conclusion

This test report clearly shows that the EUT is in compliance with the FCC Part 15B, Class B specification.

The minimum margins to the limits are as follows:

Conduction measurement	14.2 dB	at	0.187 MHz
Radiation measurement	5.4 dB	at	600.010 MHz

8.4 Sample Calculations

8.4.1 Conducted Emission

Example @ 0.187 MHz

$$\begin{array}{rcl}
 \text{Emission Level} & = & \text{Meter Reading} & 49.9 \text{ dBuV} \\
 & & + \text{ A.M.N. Factor} & + 0.1 \text{ dB} \\
 & & & \hline
 & & = & 50.0 \text{ dBuV}
 \end{array}$$

$$\begin{array}{rcl}
 \text{Margin} & = & \text{Limit} & 64.2 \text{ dBuV} \\
 & & - \text{ Emission Level} & - 50.0 \text{ dBuV} \\
 & & & \hline
 & & = & 14.2 \text{ dB}
 \end{array}$$

A.M.N. : Artificial Mains Network = Line Impedance Stabilization Network (LISN)

8.4.2 Radiated Emission

Example @ 600.010 MHz

$$\begin{array}{rcl}
 \text{Emission Level} & = & \text{Meter Reading} & 15.1 \text{ dBuV} \\
 & & + \text{ Factor} & + 25.5 \text{ dB} \\
 \text{(Factor = Antenna Factor + Cable Loss)} & & & \hline
 & & = & 40.6 \text{ dBuV/m}
 \end{array}$$

$$\begin{array}{rcl}
 \text{Margin} & = & \text{Limit} & 46.0 \text{ dBuV/m} \\
 & & - \text{ Emission Level} & - 40.6 \text{ dBuV/m} \\
 & & & \hline
 & & = & 5.4 \text{ dB}
 \end{array}$$

SECTION 9. PHOTOGRAPHS OF TEST SET-UP

Test setup in accordance with ANSI C63.4-1992

9.1 Conducted Emission Test



Front View



Rear view

9.2 Radiated Emission Test



Front View



Rear view

Note : Maintaining 10cm spacing between all the equipment cabinets.

SECTION 10. INSTRUMENTS USED FOR TEST

Instrument	Model No.	Serial No.	Manufacturer	Last cal.	Period
EMI Test Receiver	85462A	3520A00241	Hewlett Packard	8/2003	1 Year
RF Filter Section	85460A	3448A00210	Hewlett Packard	8/2003	1 Year
PREAMPLIFIER	8449B	3008A01744	Agilent Technologies	1/2004	1 Year
Biconical Antenna	BBA9106	92131214	Schwarzbeck	3/2003	1 Year
Logperiodic Antenna	UHALP9107	1622	Schwarzbeck	3/2003	1 Year
Double Ridged Antenna	3115	9702-5139	EMCO	9/2003	1 Year
Artificial Mains Network(AMN)					
= Line Impedance Stabilization Network(LISN)					
	ESH3-Z5	840062/024	Schwarzbeck	7/2003	1 Year
Artificial Mains Network(AMN)					
= Line Impedance Stabilization Network(LISN)					
	ESH3-Z5	840062/028	Schwarzbeck	8/2003	1 Year

SECTION 11. PRECISION

Tolerances of the measuring instruments are shown on below.

- | | |
|--|---------------|
| 1. Antenna factor | ± 2.0 dB |
| 2. Cable loss | ± 1.0 dB |
| 3. EMI test receiver | ± 2.0 dB |
| 4. Artificial Mains Network(AMN)
= Line Impedance Stabilization Network(LISN) | impedance 20% |
| 5. Site Attenuation | ± 4.0 dB |

Repeatability and reproducibility about maximum emission setup are not specified herein.

SECTION 12. VALIDITY TEST REPORT

- 12.1 The test result of this report is effective for equipment under test itself and under the test configuration described on the report.
- 12.2 This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.
- 12.3 Copying of this report without permission is prohibited.